



Walgreens S/4HANA Transition to Hybrid Cloud Technical Architecture Journey

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About the Speakers

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- SAP Technical Architect, Walgreens Boots Alliance
- Led several successful large scale, complex global SAP implementations

Gunther Schmalzhaf

- SAP SE
- IT-Planning Architect supporting SAP customers in their cloud transition processes and provides strategic guidance

Key Outcomes/Objectives

1. Importance of architecting HANA landscape to meet business objectives
2. Challenges of evolving technology
3. SAP best practices and methodology in this area

Agenda

- Walgreens Company Overview
- Walgreen's Retail & Finance Transformation Project
- Architecture Definition Methodology
- Walgreens Technical Architecture
- Experiences and Learnings

Three Success Stories Coming Together

The first global pharmacy-led,
health and wellbeing enterprise

Walgreens



Alliance  Healthcare



Two iconic retail pharmacy brands and a leading international pharmaceutical wholesaler

About WBA

Presence in **more than 25*** countries

More than **385,000*** people employed

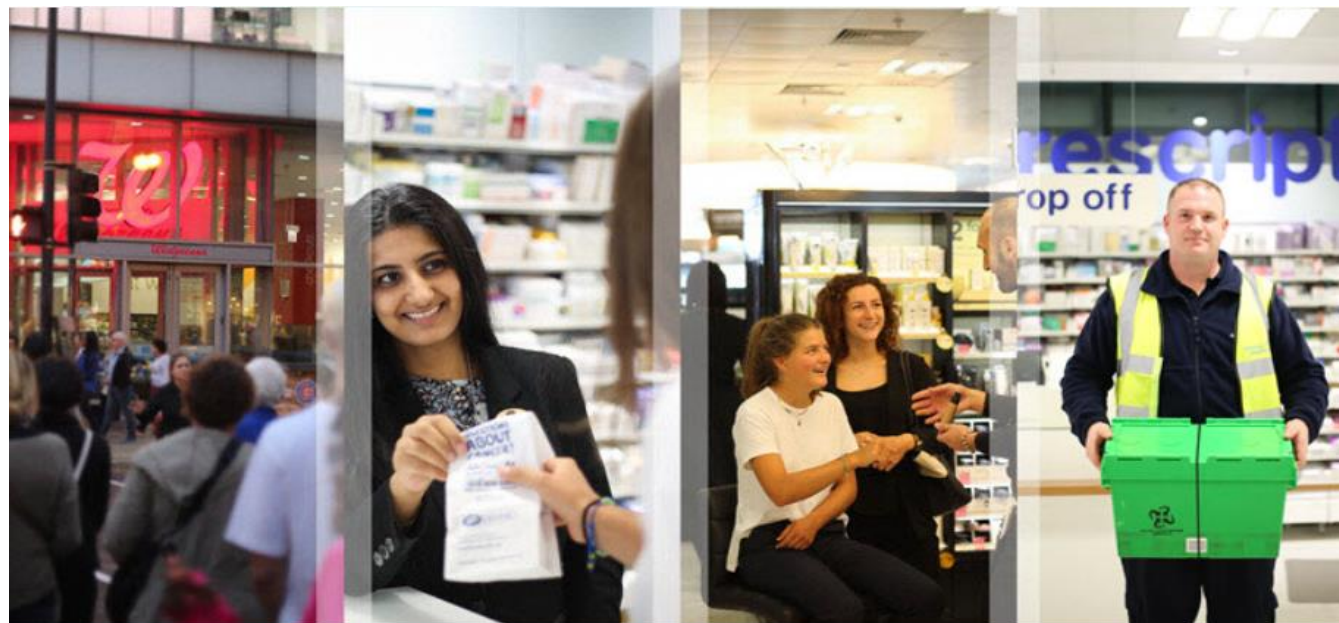
One of the world's **largest purchasers** of prescription drugs and many other health and wellbeing products

The largest retail pharmacy, health and daily living destination in the U.S. and Europe

A global leader in pharmacy-led, health and wellbeing retail with approximately **14,500**** stores in **11*** countries

One of the largest global pharmaceutical wholesale and distribution networks with more than **390*** distribution centres in **20*** countries

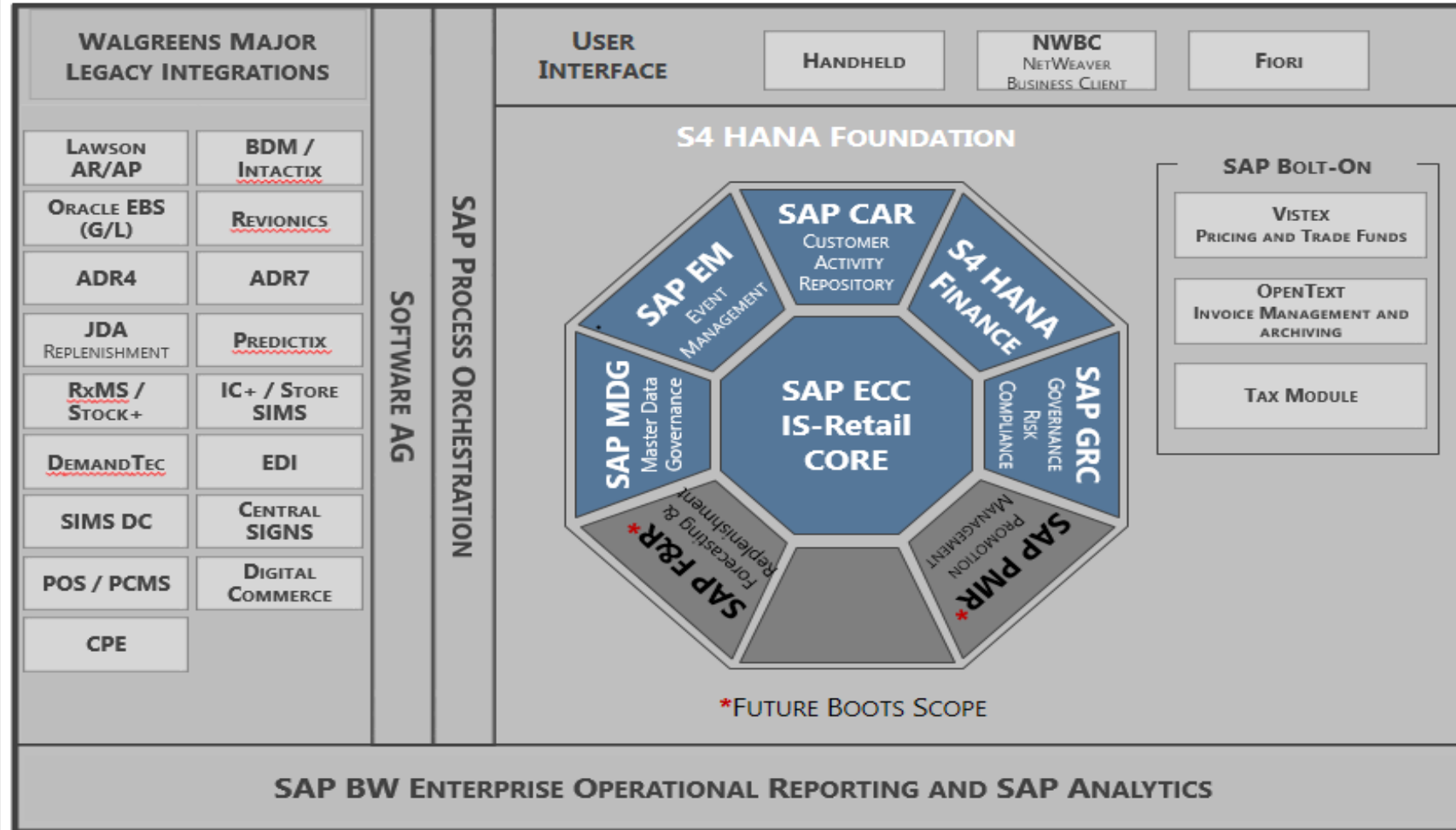
- *Figures as of 31 August 2017, including equity method investments, using publicly available information for AmerisourceBergen.*
- *** As of 28 June 2018.*



Walgreen's Retail & Finance Transformation Project

SAP Solution Stack at Walgreens

Walgreens Application Scope



SAP Functional Usage at Walgreens

Transform Legacy Retail & Finance Business Process to SAP

- Manage Finance
- Retail :
 - Procure to Pay
 - Plan to Purchase
 - Channel Execution
 - Master Data
- CAR – Customer Activity Repository
- BW - Report to Enterprise
- Roll-Out SAP to all the stores & distribution centers
- Enhance the POS Solution with Centralized Functions



Architecture Definition Methodology

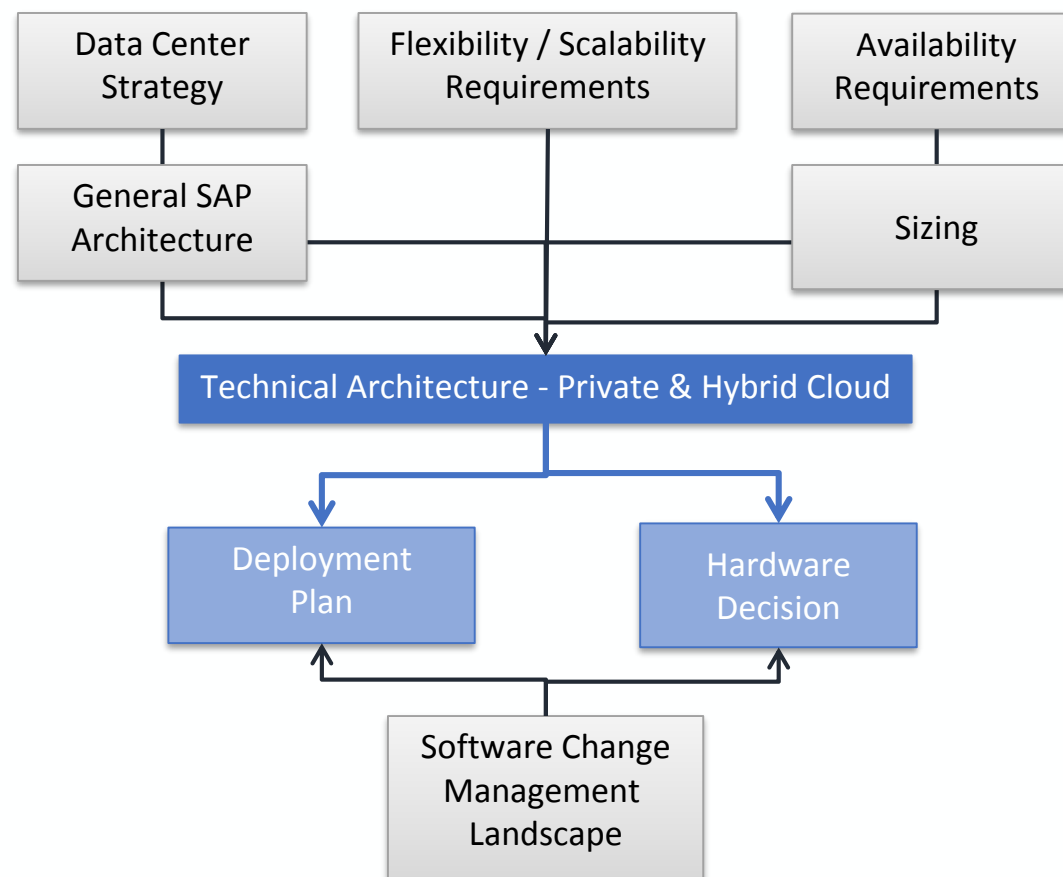
Architecture Definition Methodology

Objective

- Develop a technical architecture and IT Infrastructure concept for SAP solutions based on SAP HANA considering customer' boundary conditions
- Focus on private cloud, IAAS, SAAS and PAAS

Approach

- Introduction of typical architecture and landscape options
- Discussion of design aspects and definition of technical architecture building blocks
- Major focus on standardization, scalability and flexibility



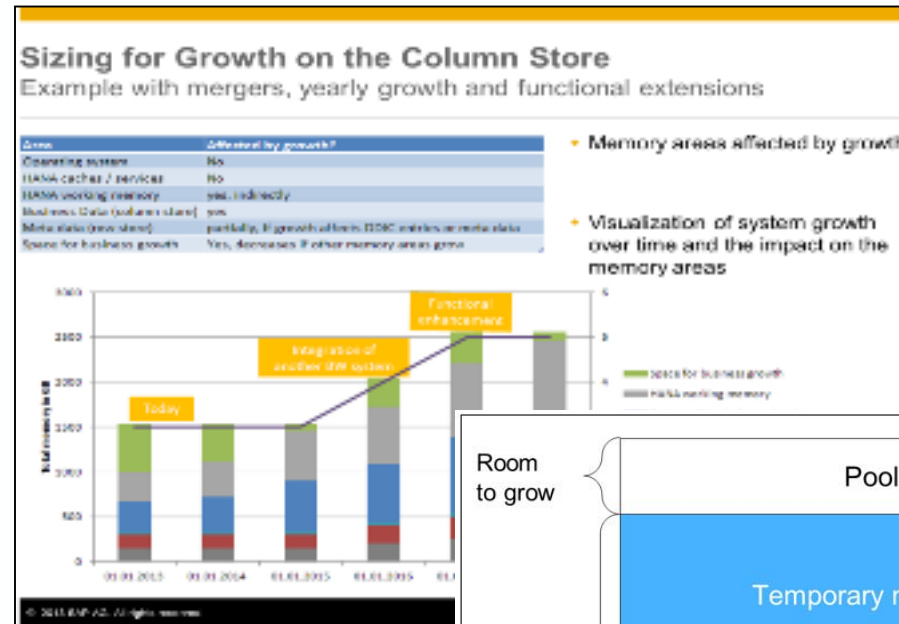
Define Required Capacity

Sizing, Scalability, Performance

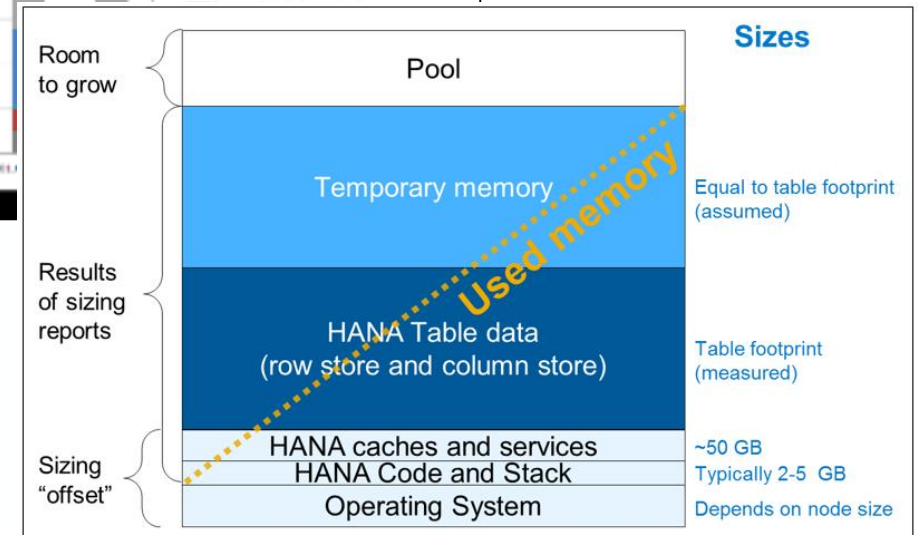
- HANA DB layer & SAP Application Server sizing

Result

- Required capacity for new or existing PRD and non-PRD HANA landscape
- Prediction of future growth extrapolated from the past and aligned with tiering and aging plans



Workshop Examples



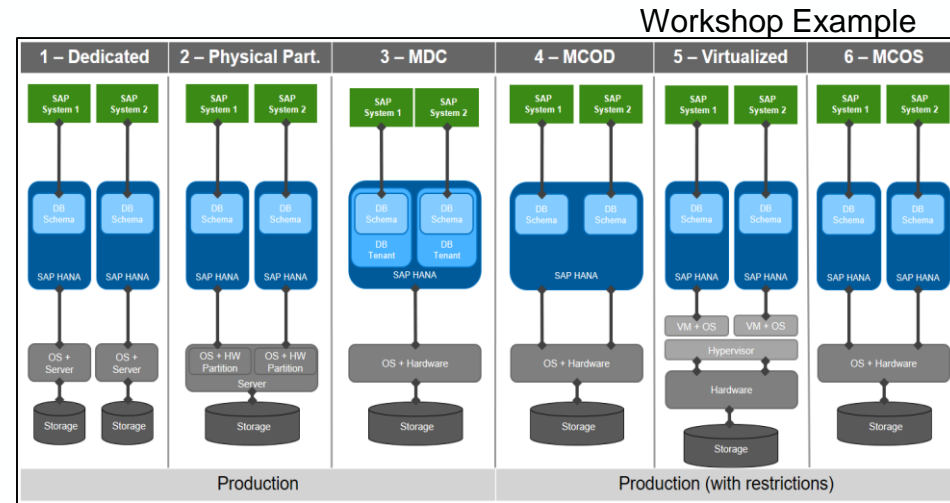
Deployment & Technical Landscape

Technical platform options and architecture

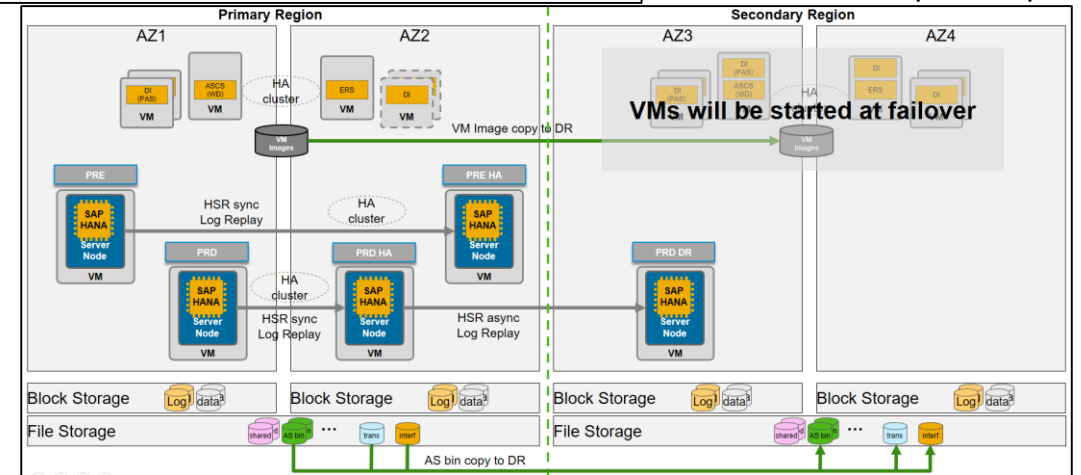
- HANA and SAP AS topology definition
- Define standardized templates where all systems in focus are covered

Result

- Definition of server, storage and network layout
- Architecture outline enabling to install landscape



IAAS Cloud Example Template



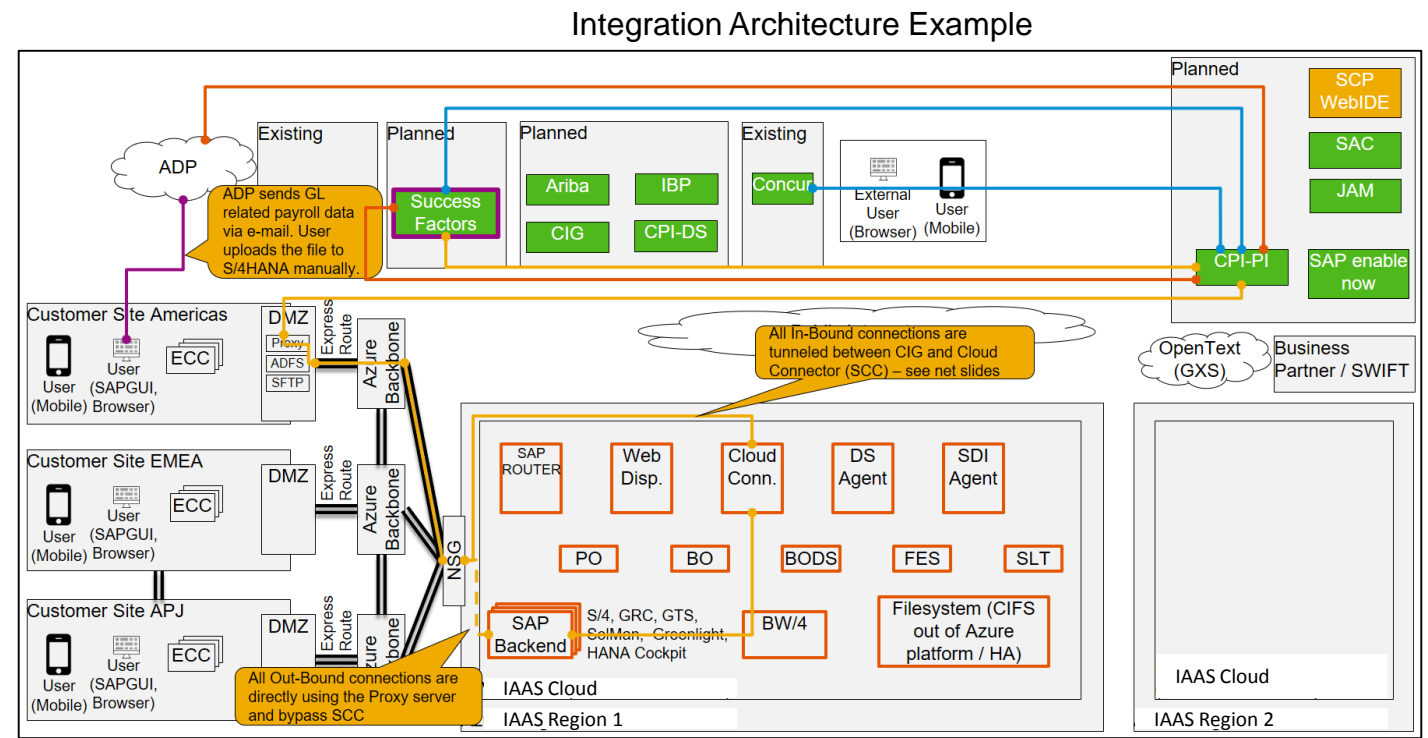
Integrate Cloud with On-Premise

Technical architecture for hybrid cloud

- Analyze technical integration scenarios, access and data flows
- Failure case analysis
- Software change management & testing
- Security

Result

- Definition of a technical architecture for all layers from on premise up to the entry point into one or more cloud solutions (IAAS, PAAS, SAAS)



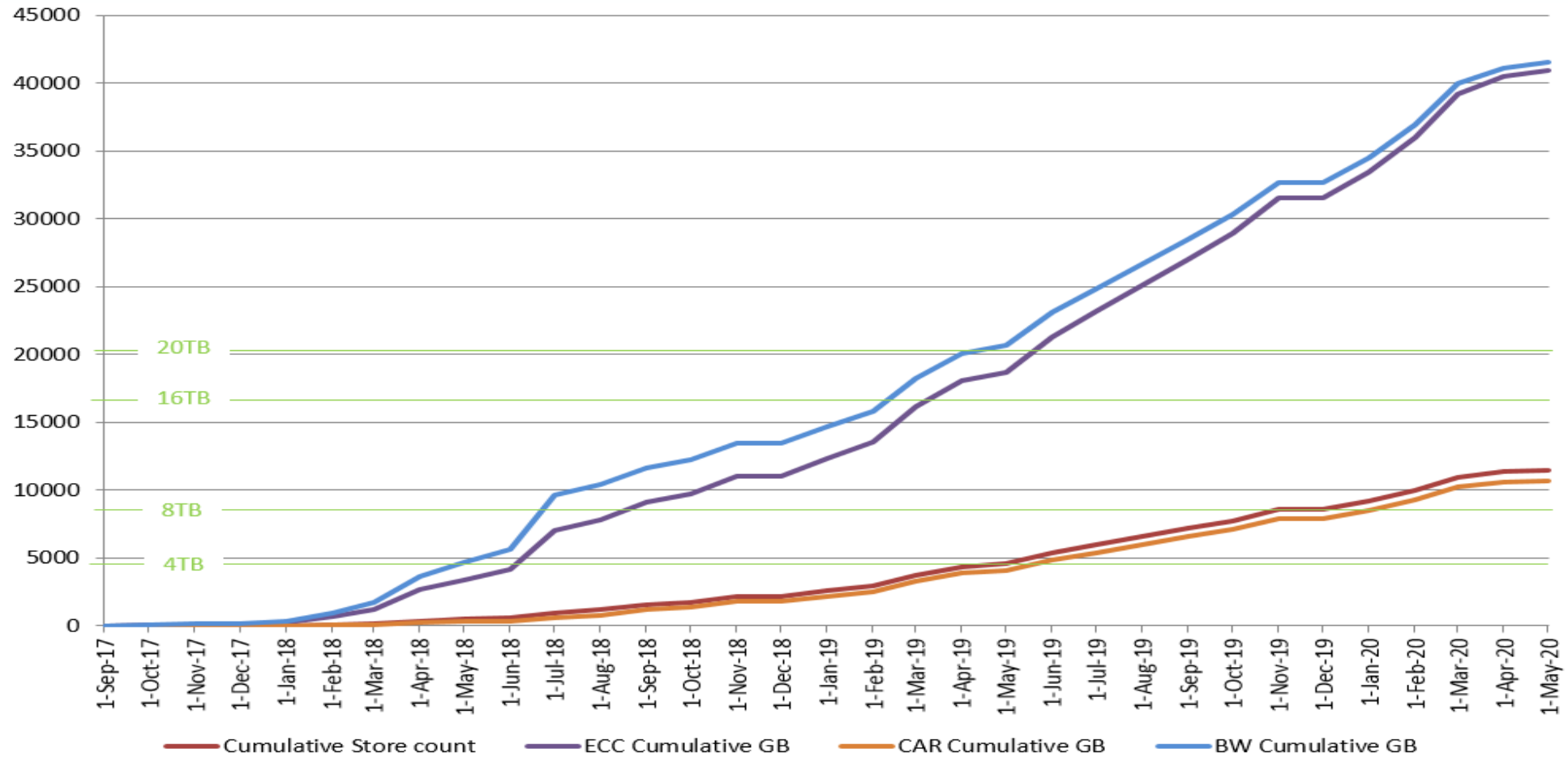


Walgreens Technical Architecture

Current Technical Architecture

- Landscape includes the target Retail & Finance Solution on S/4 HANA 1709 (10,000+ stores) plus SAP CAR and SAP BW
- Capacity planning along the projected system growth
- Hybrid Cloud Approach with all Production Systems in Walgreens Data Center & Non-Production systems in Microsoft Azure
- Hardware provider - HPE
- HANA on physical servers and SAP AS on virtual machines
- High Availability and Disaster Recovery setup across two data centers
- SAP HANA implementation based on SAP HANA Tailored Datacenter Integration (TDI) & HANA Appliance approach

Capacity Planning – Projected Growth



System Landscape Architecture

System grouping defines infrastructure templates

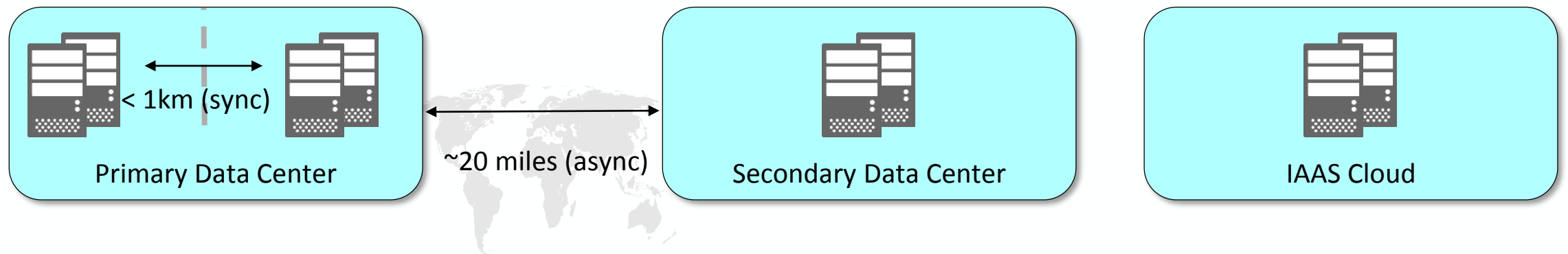
- Central S/4HANA system based on 1709
- Fiori usage requires Frontend server
- SAP Landscape Manager manages system landscape
- PO used for integration

| Systems | Topology | ABAP/JAVA |
|-------------------------|-------------------------------------|-----------|
| S/4HANA (Retail) | Scale up (may scale out afterwards) | ABAP |
| CAR | Scale out | ABAP |
| BW | Scale out | ABAP |
| Fiori FES | Scale up (MCOS) | ABAP |
| SAP EM | Scale up (MCOS) | ABAP |
| MDG | Scale up (MCOS) | ABAP |
| SolMan | Scale up (MCOS) | ABAP+JAVA |
| PO | Single node | JAVA |
| SLT | Single node | ABAP |
| SLD | Single node | JAVA |
| GRC | Single node | ABAP |
| SAP LaMa | Tenant | JAVA |

Data Center Setup

Hybrid data center setup

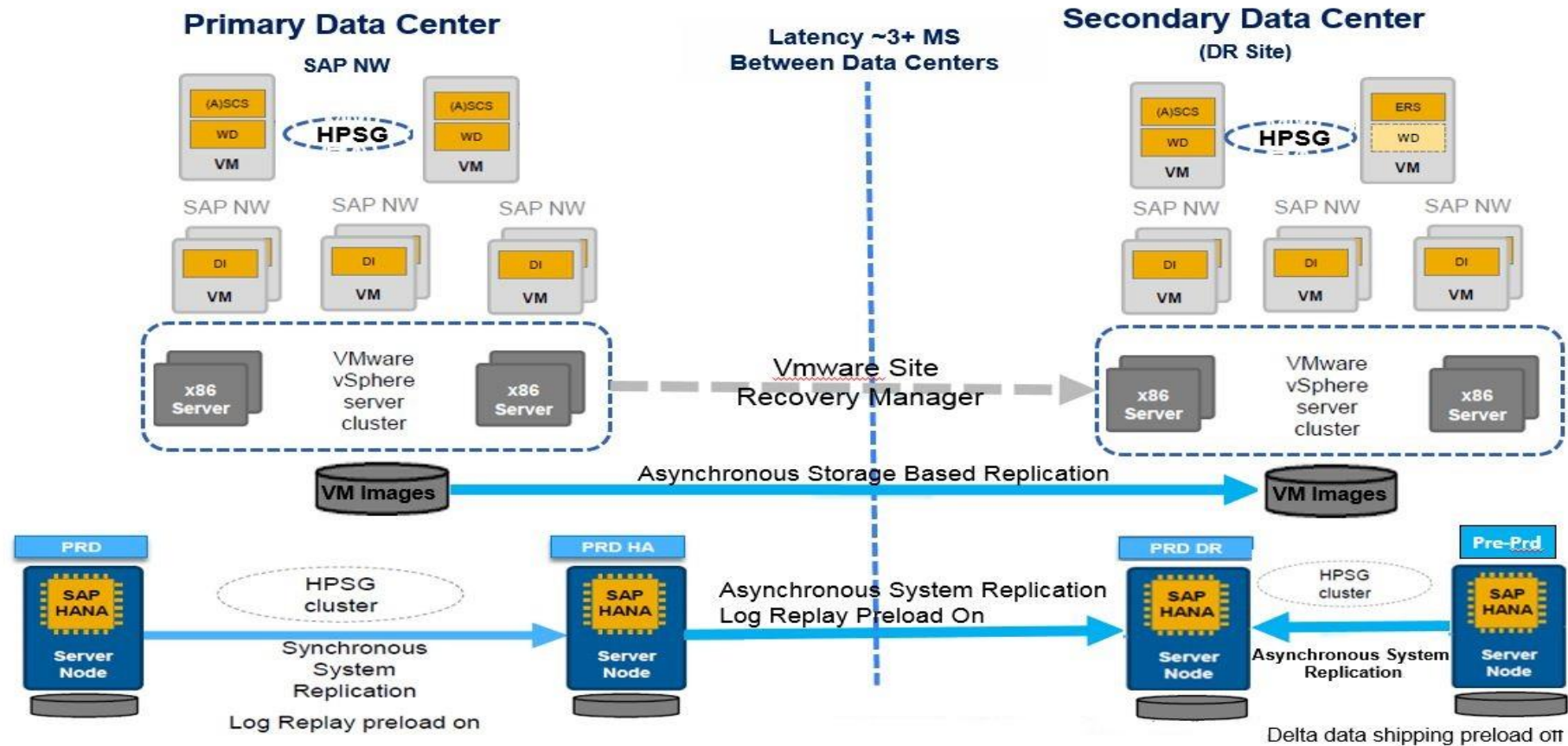
- Production and Pre-Production Environments are hosted in the On-Premise data center
- Primary data center built with availability zone (AZ) concept
- Secondary data center ~20 miles distance to primary (latency requires asynchronous replication)
- Development, Quality, Training systems hosted on Microsoft Azure



Infrastructure Template Definition

Technical Architecture Definition

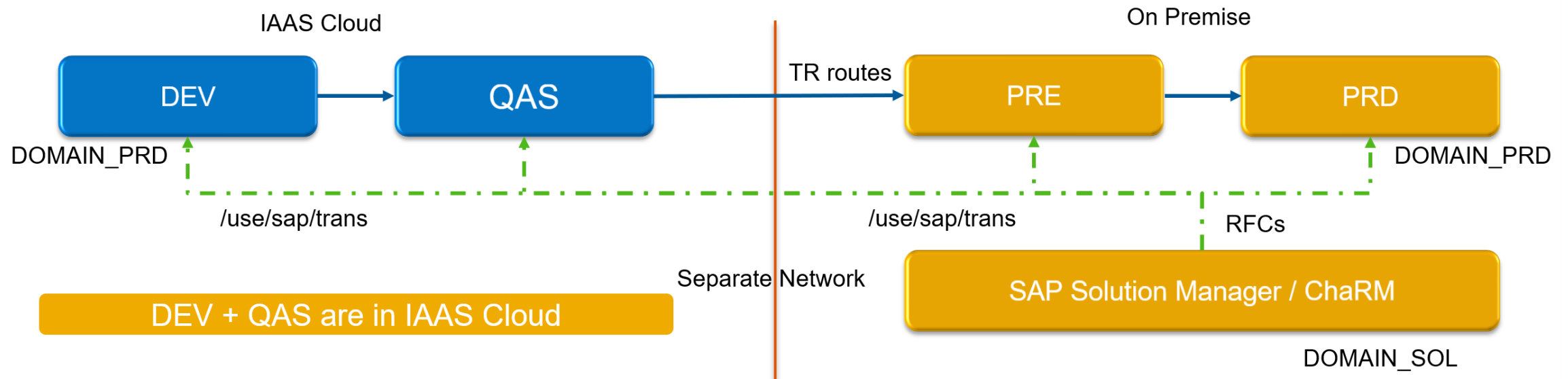
- Template below defines the S/4HANA Architecture



Non Production Systems on MS Azure

Production and Non-Production System Landscape

- Transport Landscape between IAAS Cloud & On-Premise Environment





Experiences and Learnings

What we will do again!

- Continue using HSR over Storage Replication
- Clustering Solution for ERS & ASCS
- Scale-Up – Have an HA node in the same DC
- Dedicated NAS Mount Points
- Engage SAP Max Attention Team for Platform Design

What did we learn..

- Do not deviate from the use of native OS Clustering Solution for the ERS & ASCS
- Evaluate Complexity before Re-Purposing the Pre-Prod or Perf system for DR
- Backup/Recovery Solution (Dedicated Storage) required to deal with large data volumes
- SAP HANA TDI concept provided more flexibility over SAP HANA Appliances

Walgreens Future SAP Strategy

- Migrate S/4 Scale-Up to Scale-Out Environment (End State ~40 TB size)
- Migrate the entire existing On-Premise Environments to Microsoft Azure
- Complete replacement of the In-Store legacy systems and Roll-Out SAP to 10,000+ Stores & Distribution Centers
- Expand BW Environment to ~100+ TB Scale-Out system
- Integrate Rx (Pharmacy Operations) with S/4

Where did we get help?

- Engagement with SAP
- HPE
- Accenture
- Microsoft

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Presentation Materials

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Q&A

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